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A PROJECT TO IMPROVE THE PROFESSIONAL SEQUENCE IN PRESERVICE TEACHER EDUCATION THROUGH THE SELECTIVE AND PLANNED USE OF NEW MEDIA.

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THE INITIAL DEVELOPMENT OF THE 2-YEAR TEACHER EDUCATION AND MEDIA PROJECT HAS DEFINED (1) AN APPROACH TO BEHAVIORAL OBJECTIVES, (2) A FRAME OF REFERENCE WITH REGARD TO TEACHING FUNCTIONS, VARIABLES, AND CONCEPTS, AND (3) AN EXAMPLE OF PROCEDURES TO BE UTILIZED AND WORK TO BE CONTRIBUTED BY THE ASSOCIATED ORGANIZATIONS FOR TEACHER EDUCATION, THE PROJECT TASK FORCES, AND STAFF. THE BEHAVING-LEARNING CYCLE, APPLICATION OF CONCEPT-USING IN TEACHING, AND A MODEL FOR THE DYNAMICS OF TEACHING HAVE BEEN GRAPHICALLY DEPICTED. (JM)

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An Introductory Report on --

A PROJECT TO IMPROVE THE PROFESSIONAL SEQUENCE IN PRE-SERVICE TEACHER EDUCATION THROUGH THE SELECTIVE AND PLANNED USE OF NEW MEDIA

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TEACHER EDUCATION AND MEDIA PROJECT

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THE AMERICAN ASSOCIATION OF COLLEGES FOR TEACHER EDUCATION

Teacher Education and Media Project

Introduction

The Association, under a contract from the U. S. Office of Education (Educational Media Branch) and in cooperation with the Associated Organizations for Teacher Education (AOTE),[1] is beginning a two-year program entitled, A Project to Improve the Professional Sequence in Pre-Service Teacher Education Through the Selective and Planned Use of New Media. The short title of the Project has been designated as Teacher Education and Media (TEAM).

As approved, the Project proposal identified anticipated outcomes and provided for some structural elements related to operation, but the exact approach to the study was assigned to the Project staff with assistance from an advisory committee. The purpose of this paper is to provide the membership of the Association and other interested groups and persons with information about the development of the TEAM Project.

By necessity this report cannot include all of the references and consideration that have been used or given. Presented in this paper are a brief orientation to the Project, an approach to behavioral objectives, and a frame of reference with regard to teaching functions, concepts and/or hypotheses for teaching and decision-making. Further, an example of the procedures to be utilized and the work to be contributed by the AOTE, the Project task forces, and the staff are included.

Project Purposes

The purposes of the Project, as specified in the original proposal, are to produce the following outcomes:

1/ The member organizations of AOTE are: American Home Economics Association; American Vocational Association; Association for the Education of Teachers in Science; Association for Field Services in Teacher Education; Association for School, College, and University Staffing; Association for Student Teaching; Department of Audiovisual Instruction (NEA); National Association for Business Teacher Education; National Society of College Teachers of Education; Philosophy of Education Society; and The American Association of Colleges for Teacher Education.

a. A set of guidelines for the development of instructional units which appropriately utilize the new media for teaching the professional curriculum in teacher education. These guidelines are to be based on:

   1) A detailed statement of the major behavioral objectives (teacher competencies) of the professional components of pre-service teacher education.

   2) An organized statement of the content and experiences (curriculum) relevant to the achievement of these objectives. (The development of these statements on objectives, content and experiences shall take into account the impact which the use of new media has on the nature of the learning experiences.)

b. Plans and proposals for developing these technological instructional units and for organizing them into multimedia instructional systems appropriate for achieving the purposes of teacher education.

c. Suggestions regarding the restructuring of the organization of pre-service teacher education in order to take full advantage of the positive contributions of the new media.

d. A comprehensive framework for selecting and/or developing projects designed to facilitate the introduction, appropriate use and evaluation of educational technology in teacher education and to assess the impact of educational technology on learning experiences.

e. Periodical reports to teacher educators regarding new and promising uses of new media in teacher education.

f. A resource file and clearinghouse of materials and information which will serve as a foundation for the development of technological instructional units for teacher education.

Each of the above stated "anticipated outcomes," with the possible exception of "e," is in some way dependent upon the "detailed statement of the major behavioral objectives (teacher competiencies)" called for in "a-1." Consequently, the identification and statement of behavioral objectives requires that a concept of teaching and a number of assumptions and generalizations be established. This paper will consider some of the related factors which have been identified as contributing to the development of the Project.

Behavioral Objectives

There are many statements of objectives for teacher education and descriptions of the experiences that prospective teachers should have within the professional element of a program of teacher education. Specification of program objectives is required for NCATE[2] accreditation. Many states require similar statements for institutions as prerequisites to approval for the preparation of teachers. Since many of these statements tend to be expressed in rather broad terms as ultimate objectives and more specific statements are required by the Project proposal, "behavioral objectives" will be approached by the TEAM Project within the context developed by Mager.[3] He suggests that the following questions be applied to statements of objectives:

1) Does the statement describe what the learner will be doing when he is demonstrating that he has now reached the objective?

2) Does the statement describe the important conditions (givens and/or restrictions) under which the learner will be expected to demonstrate his competence?

3) Does the statement indicate how the learner will be evaluated? Does it describe at least the lower limit of acceptable performance?

To apply Mager's criteria in all cases will prove difficult, but where possible an effort will be made.

Theory of Teaching

Research on teaching has increased significantly in recent years. The current developments in theory of teaching or instruction not only indicate renewed interest but are providing promising formulations of value to program development in teacher education. Related to and supportive of the research and theory in teaching are the newer developments in defining structures of knowledge and learning. Work in the cognitive domain and learning processes is of particular value.

2/ National Council for Accreditation of Teacher Education, Standards and Guide for Accreditation of Teacher Education (Washington, D. C.: the Council, 1960), p. 4.

3/ Robert F. Mager, Preparing Objectives for Programmed Instruction (San Francisco: Fearon Publishers, 1962).

Smith[4] has concluded after several years of research on teaching that:

> A theory of teaching will consist in (a) a statement of the variables comprising teaching behavior, (b) a formulation of the possible relations among these variables and (c) hypotheses about the relations between the variables comprising teaching behavior and the variables descriptive of the psychological and social conditions within which teaching behavior occurs.

The TEAM Project will not attempt to develop a theory of teaching, but the notions that must be used for the development of behavioral objectives should be in harmony with the proposed structure of the theories which are being developed by others.

Teaching Functions

Teaching involves many different but interrelated acts, and a number of terms are used to describe what teachers do. Teaching is described in the literature in terms of roles, tasks, duties, functions, and as channels of teacher behavior. The last term is used by Ryans[5] in his information-system approach and includes the general categories of "motivating-reinforcing, presenting-explaining-demonstrating, organizing-planning-managing, evaluating and counseling-advising behaviors."

Sullivan[6] states that "the major categories of teaching are planning for teaching, motivating pupils, developing classroom climate, managing the classroom, interacting with pupils, teaching by example, evaluating pupils, evaluating the teaching process." Sullivan also lists a number of teaching activities for each category and "hypotheses from the literature which relate to these activities."

4/ B. Othanel Smith, "Toward a Theory of Teaching," Theory and Research in Teaching, ed. Arno A. Bellack (New York: Bureau of Publications, Teachers College, Columbia University, 1963), pp. 1-10.

5/ David G. Ryans, An Information-System Approach to Instruction with Special Reference to the Teacher, Paper presented at the Annual Meeting of the American Education Research Association, Chicago, Illinois, February 13, 1963 (SP - 1079; Santa Monica, California: System Development Corporation, March 20, 1963).

6/ George Sullivan, The Image of the Effective Teacher (New York: The Central School Study, Teachers College, Columbia University, 1962), Chap. 4.

The statements by the Commission on Teacher Education (California)[7] for the "Roles of the Teacher" are in terms of teacher competencies. The major roles are listed as "director of learning, counselor and guidance worker, mediator of the culture, member of the staff and member of the profession."

The TEAM Project will not attempt to develop a composite list of teaching acts or deal with all of the areas contained in the literature, even though this would be most desirable. At this time the emphasis will be directed to the teaching functions most closely related to curriculum content. Behavioral objectives will be related to the following teaching acts which are common to all levels and areas.

1) ORGANIZING CONTENT.

   a. Setting pupil behavioral objectives.
   b. Formulating concepts as objectives.
   c. Identifying required perceptual experiences.
   d. Setting up tryout experiences.
   e. Controlling material for relevance.
   f. Selecting media and materials.

2) GUIDING PUPIL RESPONSE TO CONTENT.

   a. Guiding for perception.
   b. Assisting concept formation.
   c. Stimulating concept using in decision-making and tryout.
   d. Conducting interaction of teacher and pupil and content (questioning, suggesting, explaining).

3) EVALUATING AND REPLANNING.

   a. Relating measurement to objectives.
   b. Constructing and/or using reliable measurement devices.
   c. Interpreting and reporting results.

The three areas are interrelated. For example, in performing the function of "setting pupil behavioral objectives" the development of a plan for "relating measurement to objectives" and the strategies for "guiding pupil responses" must be anticipated.

7/ The Commission on Teacher Education, Teacher Competence: Its Nature and Scope (Burlingame, California: California Teachers Association, 1957).

Variables Related to Teaching

Teacher behavior is not only related to function--there are large numbers of interrelated variables associated with the teaching process. Ryans[8] has grouped the variables by "teacher system, pupil system and situation complex." Within the teacher system such variables as "physical-physiological characteristics, general capabilities, characteristic abilities--capacities, characteristic teacher behaving styles, characteristic affective sets and retrievable information" are considered. The pupil system includes the same major categories, but the sub-areas are specifically focused on the learner. Included in the situation complex are such variables as "objectives-goals, behavior-content, aids, administrative policies, counseling-guidance and culture."

The many variables associated with teaching may be categorized or grouped in several different ways. The more common classification has been by courses or subject areas such as, social foundation, psychological foundations or curriculum. For an analysis of teaching it appears advantageous to group the variables on the basis of their origin. Four major variable-sources will be considered by the TEAM Project: curriculum-content, pupil-class, environment and teacher sources.

1) CURRICULUM-CONTENT. Included are the factors related to the cognitive-affective, psychomotor and symbolic content and the self-directing or autonomous learning processes, such as how to learn, analyze and solve problems.

2) PUPIL-CLASS. The areas associated with the student as a person, learner and member of a group, such as student and group abilities, capacities, attitudes, values and *growth are included in this category.*

3) ENVIRONMENT. The variables external to the teacher and student which affect the teacher, teaching, learning and/or the pupil are to be considered. This is a complex group and may be divided later, but at the present time such factors as teaching resources or aids, the local and larger community influences and institutionally based policy, organization, administration and facilities are listed.

4) TEACHER. The variables originating with the teacher as a person and professional, such as his self concept, adjustment, needs, interests, motivation, attitudes, values, abilities and knowledge are grouped in this category.

8/ David G. Ryans, op. cit.

All of the variables have not been listed, and an exact meaning for the several terms has not been established at this time. As the Project effort progresses the meanings of variables will be expressed as hypotheses or concepts related to the teaching process. The magnitude or significance of a variable for teacher behavior will be examined in terms of the particular teaching function to be performed.

Concept-Formation and Concept-Using

Teaching is a complex, dynamic process. Behavior for a particular teaching function utilizes the teacher's perceptions and conceptualizations related to the factors involved in the teaching-learning situation. Decisions are required of teachers, and whether these decisions are intuitive and unrecognized, or conscious and examined, they are made.

Woodruff[9] has recently completed a study of the research on cognition with particular emphasis on teaching and learning. The ideas developed on concept-formation and the probable relationship between concepts and decision-making are valuable to the TEAM Project.

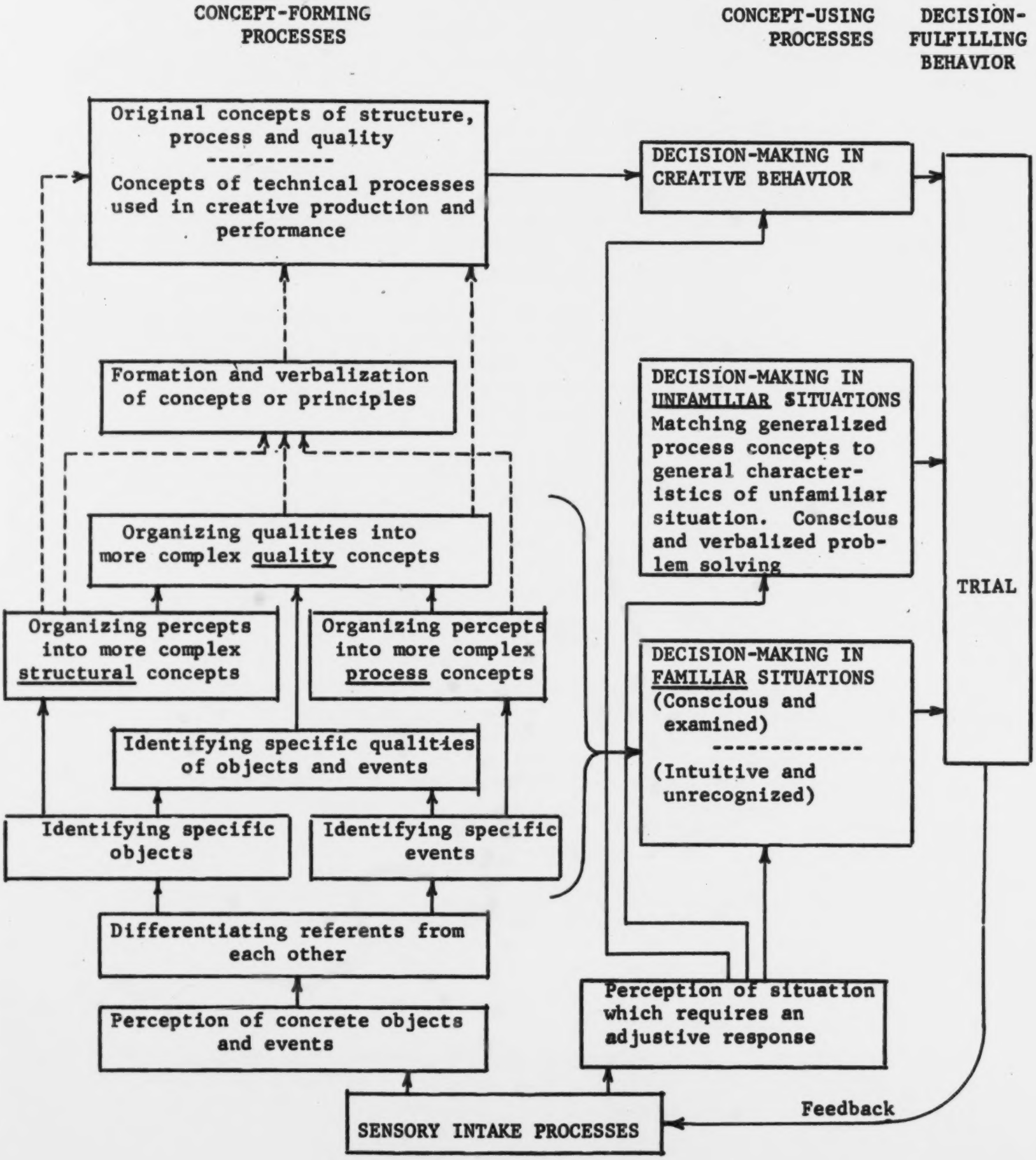
As shown in Figure 1, Woodruff considers the first process in the formation of concepts, differentiation, has been achieved when the various entities in one's environment have been separated from each other so that the identity of each is recognized on contact and one is not mistaken for another. "When this separation has been achieved it is possible for the perceptual process to produce recognition of at least three different kinds of meaning." Attention may be focused on "(1) the structural characteristics of the referents, or (2) on the function the referent is performing and the consequence which is being produced by that function, or (3) on the qualities of the referent..."

Structural concepts emerge from the differentiation of the structural characteristics perceived. Then groupings based on the structural features are formed. At a still higher level concepts of categories of groups based on structural similarities are formed. Process concepts at the first level would consist of a mental image of one specific event carrying out a function with its consequence. "The next level would consist of a concept in which are integrated two or more specific entities which together carry out a common and larger process with its results." Concepts of qualities are those in which the quality has been abstracted from the structure and process in which it was perceived and is now conceived in a new form.

9/ Asahel D. Woodruff, "The Use of Concepts in Teaching and Learning" (in the files of the TEAM Project. To be published in the Journal of Teacher Education, March 1964).

FIGURE 1

The behaving-learning cycle, differentiating between creativity, problem solving, and following concepts in familiar situations.


CONCEPT-FORMING PROCESSES
CONCEPT-USING PROCESSES
DECISION-FULFILLING BEHAVIOR
Original concepts of structure, process and quality
Concepts of technical processes used in creative production and performance
DECISION-MAKING IN CREATIVE BEHAVIOR
Formation and verbalization of concepts or principles
DECISION-MAKING IN UNFAMILIAR SITUATIONS Matching generalized process concepts to general characteristics of unfamiliar situation. Conscious and verbalized problem solving
Organizing qualities into more complex quality concepts
TRIAL
Organizing percepts into more complex structural concepts
Organizing percepts into more complex process concepts
DECISION-MAKING IN FAMILIAR SITUATIONS (Conscious and examined)
(Intuitive and unrecognized)
Identifying specific qualities of objects and events
Identifying specific objects
Identifying specific events
Differentiating referents from each other
Perception of concrete objects and events
Perception of situation which requires an adjustive response
Feedback
SENSORY INTAKE PROCESSES

Woodruff includes the following statement as a partial summary of concept formation:

> As any of these concepts move toward increasing scope, complexity and maturity, they begin to involve all three kinds of meaning; although it appears that when they reach this state the process element dominates, and they take on the role of process concepts in decision-making behavior.
>
> It is not easy at this time to make final identification of all interrelationships with exactness. Even so, these preliminary models have already proved to be helpful in curriculum planning. Process concepts seem rather clearly to be the basis of most decision-making (Tolman, 1932. Chap. 1) because decisions tend to pertain to the resolution of situations which require adjustmental responses (Klotsche, 1961) and therefore are preludes to adjustive acts in which the process believed to lead to satisfaction of a need is selected and carried out. If this is true, then process concepts become our most important objectives in education which is intended to affect behavior.

Woodruff develops decision-making as a concept-using process and states that "concepts, whether intuitive or criticized and verbalized, are equally able to mediate behavior..." He also differentiates levels of decision-making that are a near equivalent to the ideas of complexity and maturity he has applied to concept formation. Woodruff cautions "that any taxonomy of concepts is necessarily tentative," but points out that "at the same time it serves a helpful hypothetical function for examining research data and education practice."

Application to Teaching

If teacher behavior for a particular teaching function is considered to be based on the supportive concepts from the curriculum, pupil, environmental, and teacher variable-sources, Woodruff's hypotheses have a direct application to the TEAM Project.

Three approaches are used in this paper to present the relationships among the selected teaching functions, the several variable-sources, decision-making and teacher behavior. First a generalized expression may be written symbolically as:

$$T_b = f\left[(C_v), (P_v), (E_v), (T_v)\right] .$$

When a specific behavior such as planning for instruction is selected, the related factors in the several categories are then considered, and the equation may be expressed as follows:

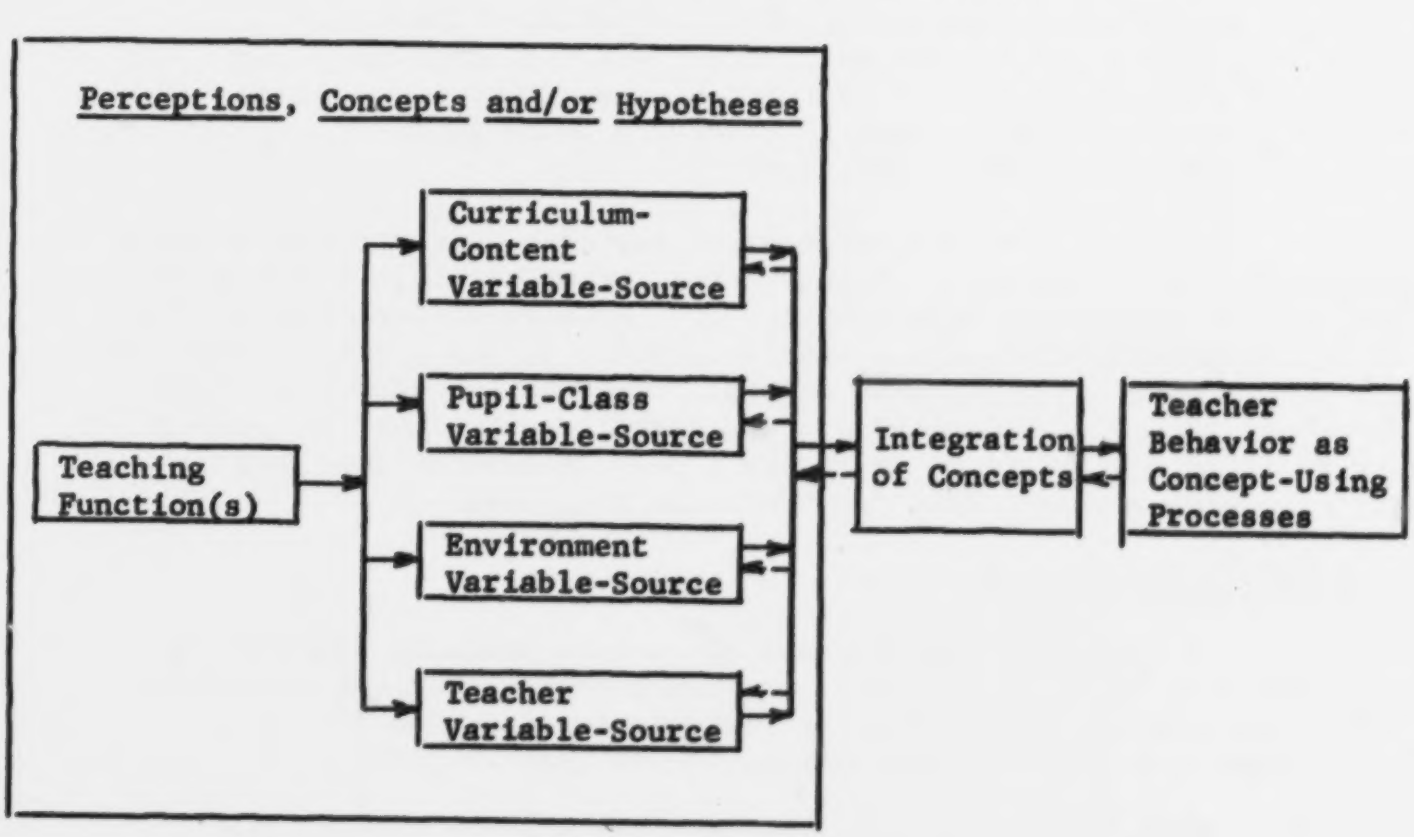
$$T_{bp} = f\,[(C_{vp}), (P_{vp}), (E_{vp}), (T_{vp})] .$$

Teacher behavior for planning is a function of the related concepts from the curriculum, pupil, environment and teacher variable-sources. For a more complete expansion of representative equations, Ryans[10] is recommended; although his approach utilizes three systems in place of the four classifications employed by the TEAM Project.

A second illustration of the application of concept-using in teaching is approximated by the following schematic diagram, Figure 2.

FIGURE 2

RELATING CONCEPTS TO TEACHER BEHAVIOR



[10]David G. Ryans, op. cit.

The teacher's perceptions, concepts and/or hypotheses relative to the teaching function and related factors from the variable-sources are directed to decision-making for behavior.

The third illustration of the relationships, Figure 3, is a cylindrical figure. The model is not conceived as being in final form, and on the basis of future work it may be materially altered or discarded. The cylinder as a model is being examined for three reasons: (1) the surfaces provide a means for introducing the several factors to be considered; (2) there appears to be some possibility to represent the dynamics involved in the teaching process, and (3) it provides a form for a detailed analysis of relationships of factors introduced on its surfaces.

The variable-sources are introduced on the edges of the end surfaces of the model and are shown, by arrows, to contribute to the inner areas, generalized concepts for decision-making and concept-using processes. The generalized concepts are considered to be formulated by the integration of the specific concepts related to the several variable-sources. The concept-using processes, in the center of the model, rest on the assumption that teacher behavior is based on and affected by the generalized principles.

Teaching functions are shown on the outer surface of the cylinder. Although there is interdependence among the functions, the model provides separation for the purpose of analysis. The significance of a given variable may change in relation to a specific teaching function, indicate a need for additional concepts, or modify in some way the concepts previously identified.

Analysis of Teaching

If one of the specific teaching functions such as "Setting Pupil Behavioral Objectives" within the larger area of "Organizing Content" is being studied, the basic question to be considered would be this: what concepts from the curriculum, pupil, environmental and teacher variable-sources are related to teacher behavior? Some examples of the concepts and hypotheses that may be considered in the stating of behavioral objectives are the following:[11]

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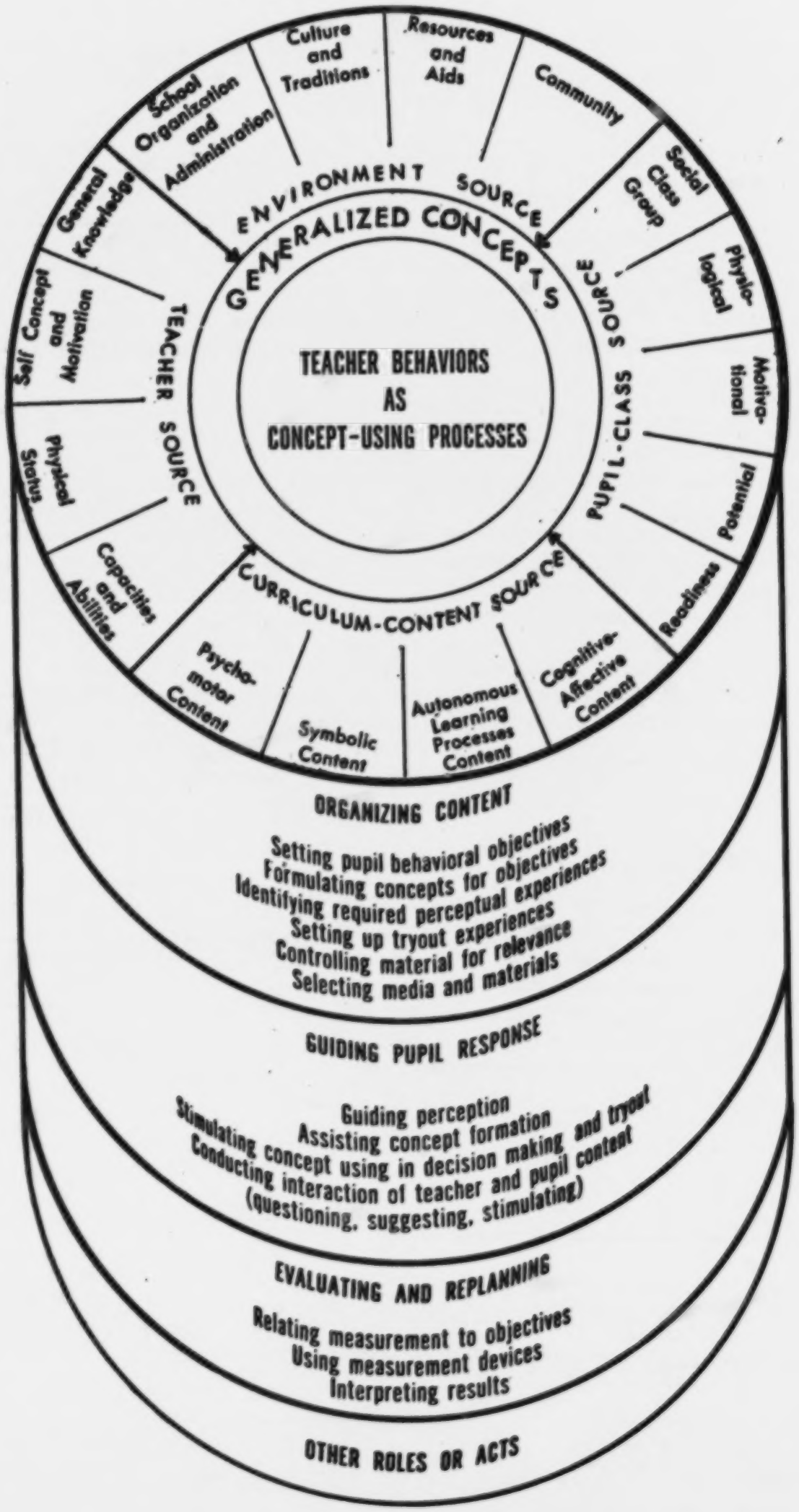
[11] In addition to the references previously given for Sullivan and The California Teachers Association, the reader will find other statements of concepts in Asahel D. Woodruff, Basic Concepts of Teaching (San Francisco: Chandler Publishing Company, 1961).

Figure 3

MODEL FOR THE DYNAMICS OF TEACHING



1) Concepts from CURRICULUM-CONTENT source.

   a. A statement of behavioral objectives describes what the learner will be doing when he has reached the objective, conditions under which the learner will be able to demonstrate his competence and how the learner will be evaluated.

   b. Learning moves cumulatively toward the major purpose when each successive lesson presents one concept or skill as its objective. (Lesson is not considered to be synonomous with class period.)

   c. The quality of a student's conceptual development depends first on how broad and how rich have been his early experiences and how well he is supplied with additional ones as he moves through the curriculum.

2) Concepts from PUPIL-CLASS source.

   a. A student's response to a learning situation will tend to vary with the level of maturity of his motives which range from spontaneous natural curiosity to intensive pursuit of high life goals.

   b. A student's receptivity to a learning situation will vary with the extent to which he is conceptually or physically "ready" to learn the content in that situation.

   c. Within a given classroom situation there is a variety of pupil differences which affect the designed learning experience.

3) Concepts from ENVIRONMENT source.

   a. Education is planned around goals ranging from one large, major aim for all education, down to the specific single objective of one lesson.

   b. A specific objective supports and is consistent with the larger aims of the school and system.

   c. Learning experiences are improved when the supportive resources, aids and facilities are available or can be readily obtained by the administration.

4) Concepts from TEACHER source.

a. Each teaching-learning experience provides personal security and offers satisfaction for the teacher.

b. The learning experience should be consistent with the behaving style (Ryans' classification) of the teacher.

c. Disciplines and school subjects are modes of inquiry and since school subjects are based on disciplines it is necessary both that the teacher understand a 'structure of the discipline' and in the translation of a school subject into learning activities the mode of inquiry should not be violated.

Behavioral Objectives

From this group of concepts a number of behavioral objectives may be derived. The following tentative statements are suggested:

1) Given a statement of aims for a particular school system, the prospective teacher can determine subject purposes which are consistent with the stated aims and can explain the theoretical basis underlying the consistency.

2) For each specific lesson objective, the prospective teacher can identify and state the basic concept(s) to be developed, establish a sequence for their development and state a rationale for the plan.

3) On the basis of certain stated behavioral objectives, the prospective teacher is able to determine the pupil readiness for a proposed learning experience and demonstrate the appropriateness of the diagnostic plan.

The Project staff is aware that the preceding objectives need to be refined and that consideration needs to be given to the evaluative element which should be included in a statement of behavioral objectives. The outline was developed to partially illustrate the process to be used in the TEAM Project.

The foregoing analysis is also shown in tabular form in Figure 4. Again the concepts or hypotheses from a variable-source are associated with a particular teaching function. On the basis of the concepts, behavioral objectives may be stated and appropriate instructional media and materials identified.

Figure 4

TENTATIVE OUTLINE FOR CONCEPT IDENTIFICATION
AND STATEMENT OF BEHAVIORAL OBJECTIVES

ANALYSIS OF TEACHING					TEACHER EDUCATION	
TEACHING ACTS	VARIABLES				BEHAVIORAL OBJECTIVES	MEDIA AND MATERIALS
	Curriculum-Content	Pupil-Class	Environment	Teacher		
Organizing Content	A statement of behavioral objectives describes what the learner will be doing when he has reached the objective, conditions under which the learner will be able to demonstrate his competence and how the learner will be evaluated.	A student's response to a learning situation will tend to vary with level of maturity of his motives which range from spontaneous natural curiosity to intensive pursuit of high life goals.	Education is planned around goals ranging from one large, major aim for all education, down to the specific single objective of one lesson.	Each teaching-learning experience provides a personal security and offers a satisfying experience for the teacher.	Given a statement of aims for a particular school system, the prospective teacher can determine subject purposes which are consistent with the stated aims and explain the theoretical basis underlying the consistency.	

As the preceding material indicates, the TEAM Project will deal with a generalized concept of teaching for selected functions. The anticipated outcomes of the Project seem to require the larger orientation, but the limitations of a broad concept are recognized, and the more detailed research must continue. Specific problems related to the teaching of certain subjects and levels, such as first grade reading and high school biology or additional elements of the teaching functions are suggested for detailed study.

Approaches to the Project

Three plans will be used to determine the concepts and develop the behavioral objectives in the Project. The basic work will be accomplished by four task forces which will be recruited to work within the frame of reference previously outlined. If possible, each of the task forces will be located at a college or university interested in restudying its programs of teacher education and also concerned with the use of new media in teacher education. Each task force will consider the total problem first, but more specific assignments will be developed as the work progresses.

The second approach will be made by each member organization of the Associated Organizations for Teacher Education. The work of the several groups will be done by special committees and by necessity will differ, but the contributions of these groups as they study teacher competencies from a more specialized point of view will materially strengthen the total Project effort. Recently the Educational Psychology Section of the National Society of College Teachers of Education has received financial assistance to work on the essential content for the beginning teacher within its domain.

The work of the Project staff provides a third approach. In addition to working with the task forces and AOTE, the Project staff will review the literature and attempt to refine the model. The staff will also attempt to locate and obtain advance information from the individual and group research efforts in progress and stimulate others to do some of the necessary detailed study.

No effort will be made to structure the Project work into college courses. Courses are an institutional responsibility. Because of local employment patterns or other factors, such as the college student population or the general education element of the total program which affects the student at a given college or university, more emphasis by a particular institution may well be given to certain of the behavioral objectives than to others. The Project report will be considered as a guide to the institutions for their program development.

New Media

The TEAM Project approach to an analysis of teaching as a source for behavioral objectives appears to favor those elements of the newer media concerned with single-concept transmission, simulation material and controlled perceptual exposure. It is, however, too early in the Project to consider this apparent tendency as more than an impression. More careful study within the Project and in institutions employing the newer media is needed.

The present findings within what is considered the media component of the Project indicate extensive use of newer media in teacher education by colleges and universities. The first of the "periodical reports to teacher educators regarding new and promising uses of new media in teacher education" (anticipated outcome "e") will be made in February 1964. The supportive "resource file" (anticipated outcome "f") is now being developed within the structure of a larger information storage and retrieval plan of the American Association of Colleges for Teacher Education.

Conclusion

The TEAM Project is attempting to operate in a manner that supports the anticipated outcomes. The operational plan is considered to be in harmony with current research efforts on theory of teaching, with emphasis on the development of concepts and hypotheses necessary for the decisions teachers must make. The task forces and Project staff have the major responsibility for the identification of basic concepts and the statement of behavioral objectives, but each institution and organization concerned with the quality of teacher education can contribute to the effort.

Of particular value to the Project will be reactions to this statement and reports on related studies and research. Statements of behavioral objectives and significant concepts now included in the professional courses would also be helpful. Additional copies of this paper will be furnished for faculty study upon request.